



SIGMA-ALDRICH

## Material Safety Data Sheet

Date Printed: 09/05/2008  
Date Updated: 10/06/2006  
Version 1.90

### Section 1 - Product and Company Information

**Product Name** PYRENE, FOR FLUORESCENCE  
**Product Number** 82648  
**Brand** Fluka Chemical

**Company** Sigma-Aldrich  
**Address** 3050 Spruce Street  
**City, State, Zip, Country** SAINT LOUIS, MO 63103 US  
**Technical Phone:** 800-325-5832  
**Fax:** 800-325-5052

**Emergency Phone:** 314-776-6555

### Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313	EC no	Annex I Index Number
PYRENE	129-00-0	Yes	204-927-3	

**Formula** C<sub>16</sub>H<sub>10</sub>  
**Synonyms** Benzo(ghi)phenanthrene. Coal tar pitch volatiles:pyrene (OSHA), Pyren (German), betaPyrene

### Section 3 - Hazards Identification

#### Emergency Overview

Dangerous for the environment.  
Very toxic to aquatic organisms, may cause longterm adverse effects in the aquatic environment.  
Readily absorbed through skin. Target organ(s): Blood. Kidneys.

**HMIS Rating**  
Health: 1\* Flammability: 0 Reactivity: 0

**NFPA Rating**  
Health: 0 Flammability: 0 Reactivity: 0

\*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

### Section 4 - First Aid Measures

#### Oral Exposure

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

#### Inhalation Exposure

If inhaled, remove to fresh air. If breathing becomes difficult, call a physician.

#### Dermal Exposure

In case of contact, immediately wash skin with soap and copious amounts of water.

#### Eye Exposure

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

### Section 5 - Fire Fighting Measures

**Flash Point:** > 392 °F > 200 °C

**Autoignition Temp:** N/A

#### Extinguishing Media

##### Suitable

Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

#### Firefighting

##### Protective Equipment

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

##### Specific Hazard(s)

Emits toxic fumes under fire conditions.

### Section 6 - Accidental Release Measures

#### Procedure to be Followed in Case of Leak or Spill

Evacuate area.

#### Procedure(s) of Personal Precaution(s)

Exercise appropriate precautions to minimize direct contact with skin or eyes and prevent inhalation of dust.

#### Methods for Cleaning Up

Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

### Section 7 - Handling and Storage

#### Handling

##### User Exposure

Avoid inhalation. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

#### Storage

##### Suitable

Keep tightly closed.

### Section 8 - Exposure Controls / PPE

#### Engineering Controls

Safety shower and eye bath. Mechanical exhaust required.

#### Personal Protective Equipment

##### Respiratory

Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks.

##### Hand

Protective gloves.

##### Eye

Chemical safety goggles.

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**General Hygiene Measures**  
Wash thoroughly after handling.

**Exposure Limits, RTECS**

Country	Source	Type	Value
USA	OSHA	PEL	8H TWA 0.2 MG/M3

**Section 9 - Physical/Chemical Properties**

Appearance	Physical State	Color	Form
	Solid	White	Fine crystals

**Molecular Weight** 202.26 AMU

pH	N/A
BP/BP Range	390 - 395 °C
MP/MP Range	151 °C
Freezing Point	N/A
Vapor Pressure	N/A
Vapor Density	N/A
Saturated Vapor Conc.	N/A
SG/Density	1.21 g/cm3
Bulk Density	650 kg/l
Odor Threshold	N/A
Volatile%	N/A
VOC Content	N/A
Water Content	N/A
Solvent Content	N/A
Evaporation Rate	N/A
Viscosity	N/A
Partition Coefficient	Log K <sub>ow</sub> 4.88
Decomposition Temp.	N/A
Flash Point °F	> 392 °F
Flash Point °C	> 200 °C

**Explosion Limits** N/A

**Flammability** N/A  
**Autoignition Temp** N/A  
**Solubility** N/A

N/A = not available

**Section 10 - Stability and Reactivity**

**Stability**  
**Stable**  
Stable.  
**Materials to Avoid**  
Strong oxidizing agents.

**Hazardous Decomposition Products**  
**Hazardous Decomposition Products**  
Carbon monoxide, Carbon dioxide

**Hazardous Polymerization**  
**Hazardous Polymerization**  
Will not occur.

**Section 11 - Toxicological Information**

**Route of Exposure**

**Skin Contact**

May cause skin irritation.

**Skin Absorption**

May be harmful if absorbed through the skin. Readily absorbed through skin.

**Eye Contact**

May cause eye irritation.

**Inhalation**

May be harmful if inhaled. Material may be irritating to mucous membranes and upper respiratory tract.

**Ingestion**

May be harmful if swallowed.

**Target Organ(s) or System(s)**

Liver, Blood, Kidneys.

**Signs and Symptoms of Exposure**

Inhalation studies in animals have caused hepatic, pulmonary, and intragastric pathologic changes. Neutrophil, leukocyte, and erythrocyte levels also decreased. Cutaneous application caused hyperemia, weight loss, and hematopoietic changes and dermatitis. Chronic effects: leukocytosis.

**RTECS Number:** UR2450000

**Toxicity Data**

Oral - Rat: > 16,000 mg/kg(LD50)

Oral - Rat: 2700 mg/kg (LD50)

Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste): Eye: Conjunctive irritation.

Behavioral: Excitement.

Behavioral: Muscle contraction or spasticity.

Inhalation - Rat: 170 mg/m3(LC50)

Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste): Eye: Conjunctive irritation.

Behavioral: Excitement.

Behavioral: Muscle contraction or spasticity.

Oral - Mouse: 800 mg/kg (LD50)

Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste): Eye: Conjunctive irritation.

Behavioral: Excitement.

Behavioral: Muscle contraction or spasticity.

Intraperitoneal - Mouse: 514 MG/KG (LD50)

**Irritation Data**

Eyes - Rabbit:

Remarks: Mild irritation effect

Skin - Rabbit: 500 mg 24H

Remarks: Mild irritation effect

**Chronic Exposure- Carcinogen**

Result: This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

Mouse - Skin: 10 GM/KG 3W I

Result: Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Skin and Appendages: Other: Tumors.

## IARC Carcinogen List

Rating  
Group 3

### Chronic Exposure - Mutagen

<u>Species</u>	<u>Dose</u>	<u>Cell Type</u>	<u>Mutation test</u>
Result: Laboratory experiments have shown mutagenic effects.			
Human	100 MG/L	fibroblast	Unscheduled DNA synthesis
Human	100 UMOL/L	lymphocyte	Sister chromatid exchange
Human	12 UMOL/L	Other cell types	Mutation in mammalian somatic cells.
Rat	2500 UMOL/L	liver	Unscheduled DNA synthesis
Rat	10 MG/L	Embryo	Mutation in mammalian somatic cells.
Mouse	10100 NMOL/L (+S9)	lymphocyte	Mutation in microorganisms
Mouse	10 MG/L	Embryo	Morphological transformation.
Mouse	50 UMOL/L	lymphocyte	DNA damage
Mouse	1510 UMOL/L	lymphocyte	Mutation in mammalian somatic cells.
Hamster	10 MG/L	Embryo	Morphological transformation.
Hamster	62500 UG/L	kidney	Morphological transformation.
Hamster	100 UMOL/L	liver	Unscheduled DNA synthesis
Hamster	10 MG/L	lung	Cytogenetic analysis

## Section 12 - Ecological Information

### Acute Ecotoxicity Tests

<u>Test Type</u>	
EC50 Daphnia	
<u>Species</u>	
Daphnia magna	
<u>Time:</u>	<u>Value:</u>
48.0 h	0.002 - 0.003 mg/l
<u>Test Type</u>	
LC50 Fish	
<u>Species</u>	
Onchorhynchus mykiss (Rainbow trout)	
<u>Time:</u>	<u>Value:</u>
96.0 h	> 2 mg/l

### Additional Results/Data from Relevant Scientific Experiments

Avoid contamination of the environment

## Section 13 - Disposal Considerations

### Appropriate Method of Disposal of Substance or Preparation

Contact a licensed professional waste disposal service to dispose of this material.  
Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.  
Observe all federal, state, and local environmental regulations.

## Section 14 - Transport Information

### DOT

**Proper Shipping Name:** Environmentally hazardous substances, solid, n.o.s.  
**UN#:** 3077  
**Class:** 9  
**Packing Group:** Packing Group III  
**Hazard Label:** Class 9  
**PIH:** Not PIH

### IATA

**Proper Shipping Name:** Environmentally hazardous substance, solid, n.o.s.  
**IATA UN Number:** 3077  
**Hazard Class:** 9  
**Packing Group:** III

## Section 15 - Regulatory Information

### EU Additional Classification

**Symbol of Danger:** N

**Indication of Danger**

Dangerous for the environment.

**Risk Statements** **R:** 50/53

Very toxic to aquatic organisms, may cause longterm adverse effects in the aquatic environment.

**Safety Statements** **S:** 60 61

This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.

### US Classification and Label Text

**Indication of Danger**

Dangerous for the environment.

**Risk Statements**

Very toxic to aquatic organisms, may cause longterm adverse effects in the aquatic environment.

**Safety Statements**

This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.

**US Statements**

Readily absorbed through skin. Target organ(s): Blood, Kidneys.

### United States Regulatory Information

**SARA Listed:** Yes

**Notes:** This product is subject to SARA section 313 reporting requirements.

**TSCA Inventory Item:** Yes

### Canada Regulatory Information

**WHMIS Classification**

This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

**DSL:** Yes

**NDSL:** No

## Section 16 - Other Information

### Disclaimer

For R&D use only. Not for drug, household or other uses.

### Warranty

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. SigmaAldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2008 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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## Material Safety Data Sheet

Date Printed: 10/08/2008

Date Updated: 02/02/2007

Version 1.50

### Section 1 - Product and Company Information

**Product Name** Propionic-1-<sup>13</sup>C acid, 99 atom % <sup>13</sup>C  
**Product Number** 282448  
**Brand** Aldrich Chemical

**Company** Sigma-Aldrich  
**Address** 3050 Spruce Street  
**City, State, Zip, Country** SAINT LOUIS, MO 63103 US  
**Technical Phone:** 800-325-5832  
**Fax:** 800-325-5052  
**Emergency Phone:** 314-776-6555

### Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313	EC no	Annex I Index Number
PROPIONIC-1- <sup>13</sup> C ACID, 99 ATOM % <sup>13</sup> C	6212-69-7	No		607-089-00-0

**Formula** <sup>13</sup>C<sub>3</sub>H<sub>6</sub>O<sub>2</sub>  
**Synonyms** propanoic-2,3-<sup>13</sup>C<sub>2</sub> acid

### Section 3 - Hazards Identification

#### Emergency Overview

Combustible (USA) Flammable (EU) Corrosive.  
Harmful in contact with skin. Causes burns.  
Readily absorbed through skin. Target organ(s): Central nervous system. Blood. Combustible.

#### HMIS Rating

Health: 3\* Flammability: 2 Reactivity: 1

#### NFPA Rating

Health: 3 Flammability: 2 Reactivity: 1

\*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

### Section 4 - First Aid Measures

#### Oral Exposure

If swallowed, wash out mouth with water provided person is conscious. Call a physician. Do not induce vomiting.

#### Inhalation Exposure

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

#### Dermal Exposure

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

#### Eye Exposure

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

#### Information for Physician

Contamination of the eyes should be treated by immediate and prolonged irrigation with copious amounts of water.

#### Information for Physician

Contamination of the eyes should be treated by immediate and prolonged irrigation with copious amounts of water.

### Section 5 - Fire Fighting Measures

**Flash Point:** 129.2 °F 54 °C  
**Explosion Limits:** Lower: 2.9 % Upper: 12.1 %  
**Autoignition Temp:** 513 °C  
**Extinguishing Media**  
**Suitable**  
Carbon dioxide, dry chemical powder, or appropriate foam.

#### Firefighting

##### Protective Equipment

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

##### Specific Hazard(s)

Combustible liquid. Emits toxic fumes under fire conditions.

### Section 6 - Accidental Release Measures

#### Procedure to be Followed in Case of Leak or Spill

Evacuate area.

#### Procedure(s) of Personal Precaution(s)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

#### Methods for Cleaning Up

Cover with dry lime or soda ash, pick up, keep in a closed container, and hold for waste disposal. Ventilate area and wash spill site after material pickup is complete.

### Section 7 - Handling and Storage

#### Handling

##### User Exposure

Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

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**Storage****Suitable**

Keep tightly closed. Keep away from heat and open flame. Store in a cool dry place.

**Special Requirements**

Hygroscopic.

**Section 8 - Exposure Controls / PPE****Engineering Controls**

Safety shower and eye bath. Use only in a chemical fume hood.

**Personal Protective Equipment****Respiratory**

Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate, use a fullface respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a fullface supplied air respirator.

**Hand**

Compatible chemical-resistant gloves.

**Eye**

Chemical safety goggles.

**Other**

Faceshield (8-inch minimum).

**General Hygiene Measures**

Wash contaminated clothing before reuse. Discard contaminated shoes. Wash thoroughly after handling.

**Section 9 - Physical/Chemical Properties****Appearance****Physical State**

Clear liquid

**Color**

Colorless

**Molecular Weight**

74.08 AMU

**pH**

2.5

20 °C

Concentration: 100 g/l

**BP/BP Range**

141 - 142 °C

**MP/MP Range**

-24 - -23 °C

**Freezing Point**

N/A

**Vapor Pressure**

2.4 mmHg

20 °C

**Vapor Density**

2.55 g/l

**Saturated Vapor Conc.**

N/A

**SG/Density**

0.992 g/cm<sup>3</sup>

**Bulk Density**

N/A

**Odor Threshold**

N/A

**Volatile%**

N/A

**VOC Content**

N/A

**Water Content**

N/A

**Solvent Content**

N/A

**Evaporation Rate**

N/A

**Viscosity**

10 Pas

25 °C

**Surface Tension**

27.21 mN/m

15 °C

**Partition Coefficient**

Log Kow: 0.25

**Decomposition Temp.**

N/A

**Flash Point °F**

129.2 °F

**Flash Point °C**

54 °C

Method: closed cup

Method: closed cup

**Explosion Limits**

Lower: 2.9 %

Upper: 12.1 %

**Flammability**

N/A

**Autoignition Temp**

513 °C

**Refractive Index**

1.387

**Solubility**

**Solubility in Water:** Soluble.

**Other Solvents:** ALCOHOL, ETHER, CHLOROFORM

N/A = not available

**Section 10 - Stability and Reactivity****Stability****Stable**

Stable.

**Conditions of Instability**

Hygroscopic.

**Materials to Avoid**

Strong oxidizing agents.

**Hazardous Decomposition Products****Hazardous Decomposition Products**

Carbon monoxide, Carbon dioxide

**Hazardous Polymerization****Hazardous Polymerization**

Will not occur.

**Section 11 - Toxicological Information****Route of Exposure****Skin Contact**

Causes burns.

**Skin Absorption**

Harmful if absorbed through skin. Readily absorbed through skin.

**Eye Contact**

Causes burns.

**Inhalation**

May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.

**Ingestion**

May be harmful if swallowed.

**Target Organ(s) or System(s)**

Central nervous system, Blood, Liver, Kidneys.

**Signs and Symptoms of Exposure**

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. May cause an asthmatic-like bronchitis. Nausea, dizziness, and headache. Blood effects.

**RTECS Number:** N/A

**Toxicity Data**

Oral - Rat: 3,500 - 4,200 mg/kg (LD50)

Skin - Rabbit: 500 mg/kg (LD50)

Inhalation - Rat: >4.9 MG/L (LC50)

## Section 12 - Ecological Information

### Acute Ecotoxicity Tests

#### Test Type

EC50 Algae

**Time:** 72.0 h **Value:** 45.8 mg/l

#### Test Type

EC50 Daphnia

#### Species

Daphnia magna

**Time:** 48.0 h **Value:** 21 - 24.6 mg/l

#### Test Type

LC50 Fish

#### Species

Lepomis macrochirus (Bluegill)

**Time:** 96.0 h **Value:** 73 - 115 mg/l

#### Test Type

LC50 Fish

#### Species

Onchorhynchus mykiss (Rainbow trout)

**Time:** 96.0 h **Value:** 51 - 73.2 mg/l

## Section 14 - Transport Information

### DOT

**Proper Shipping Name:** Propionic acid

**UN#:** 3463

**Class:** 8

**Packing Group:** Packing Group II

**Hazard Label:** Corrosive

**Hazard Label:** Flammable liquid

**PIH:** Not PIH

### IATA

**Proper Shipping Name:** Propionic acid

**IATA UN Number:** 3463

**Hazard Class:** 8

**Packing Group:** II

## Section 15 - Regulatory Information

### EU Directives Classification

**Symbol of Danger:** C

**Indication of Danger**

Corrosive

**Risk Statements** R: 34

Causes burns

**Safety Statements** S: 23 36 45

Do not breathe vapor. Wear suitable protective clothing. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

### US Classification and Label Text

**Indication of Danger**

Combustible (USA) Flammable (EU). Corrosive

**Risk Statements**

Harmful in contact with skin. Causes burns.

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### Safety Statements

Keep away from sources of ignition - no smoking. Do not breathe vapor. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

### US Statements

Readily absorbed through skin. Target organ(s): Central nervous system. Blood. Combustible.

### United States Regulatory Information

**SARA Listed:** No

### Canada Regulatory Information

#### WHMIS Classification

This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

**DSL:** No

**NDSL:** No

## Section 16 - Other Information

### Disclaimer

For R&D use only. Not for drug, household or other uses.

### Warranty

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2008 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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